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What is More Likely to Predict Prejudicial Attitudes Towards Overweight Individuals: Gender, Locus of Control, or Social Dominance Orientation?

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As obesity has become an important healthcare issue, more research has revealed a pervasive bias against overweight individuals. Individuals are often perceived to be in control of their own weight, and therefore, if one is overweight they are considered lazy, lacking in self-control, and non-compliant (Rukavina & Li, 2011; Stapleton, 2013). Although obesity rates are rising across countries, there has been no reduction in the negative attitudes and prejudices expressed towards the overweight (Stapleton, 2013). This study was conducted to assess the effects that Health Locus of Control (HLOC), Social Dominance Orientation (SDO) (Pratto, Sidanius, Stallworth & Malle, 1994), and gender had on obesity bias among 144 participants (62 male and 82 female adults). The results from the Hierarchical Multiple Regression (HMR) analyses in this study indicated significant contributions to the variance for SDO (6.8%) and HLOC (5.3%) on an Anti-Fat Attitudes measure. HLOC significantly contributed to the variance for the Attitudes Towards Obese People measure (2.6%) however, gender and SDO did not. None of the three variables of interest (SDO, HLOC and gender) were significant when Beliefs About Obese People scale was used to measure obesity bias. This study aimed to explore the gap in the literature relating specifically to potential predictors of weight bias and prejudice. The findings and limitations are discussed in light of clinical intervention to reduce weight bias and directions for future research.

As obesity and weight issues have become a social "hot topic" in recent years, investigation into the area has increased exponentially. Research has suggested that weight is directly related to physical health, quality of life, and to some extent, psychological health (Friedman & Brownell, 1995). Being overweight or obese can have psychological effects, such as social withdrawal and low self-esteem (Friedman & Brownell, 1995; Puhl & Brownell, 2003). The distress caused by stereotypes and bias against people based on their weight can also have negative effects on an individual's self-esteem and motivation to get healthy and exacerbation of other psychological vulnerabilities. These effects are likely to contribute to overeating and sedentary activities (Puhl & Brownell, 2003). Puhl and Brownell's (2003) research into the origins of obesity stigma expressed the need to understand this area better in order to change such a powerful and pervasive bias. As a result, the current study aimed to explore the effect that certain predictors had on weight bias, with the aim of further understanding the origins of weight bias. The predictors or variables of interest in this study were Locus of Control (LOC), Social Dominance Orientation (SDO) and gender.

Attribution Theory and Weight Bias

One of the most empirically validated psychological frameworks to understand prejudice and bias is Weiner's (1974) Attribution Theory (Puhl & Brownell, 2003). The Attribution Theory states that people interpret behavior in terms of its causes and these interpretations play an important role in determining reactions to the behavior (Kelley & Michela, 1980; Puhl & Brownell, 2003).

When an individual encounters a person with a negative label or stigma they mentally search for its cause in their own cognitive database and subsequently form an appropriate reaction. Attributions of controllability result in more negative attitudes towards disadvantaged out-groups who are held responsible for their circumstances (Crandall, 1994). It is also suggested that if a person believes obese people should be in control of their weight he/she will blame and stigmatize them, which results in bias, discrimination and prejudice (Crandall, 1994). Crandall et al's. (1994) obesity bias research suggests that stigmas are a product of social ideologies that use negative attributions or blame to explain negative life outcomes. Individuals who view overweight people as being personally responsible (high internal causes) therefore blame the overweight individual for their size. These negative perceptions of overweight individuals are used to form impressions and expectations. This notion of individual controllability and blame then forms the basis for attribution theory in relation to weight stigma and obesity bias (Puhl & Brownell, 2003).

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Puhl and Brownell (2003) suggest that to be stigmatized is to be perceived to possess an attribute or characteristic that demonstrates a devalued social identity and as such be ascribed deviant labels. Obesity bias and weight bias relate specifically to negative attitudes towards individuals based on their physical size and perceived weight (Puhl & Brownell 2003). Therefore, stereotypes and biases about weight and obesity occur when individuals assume that people who are overweight and obese all share similar traits such as being lazy, and self-indulgent (Rukavina & Li, 2011).

Locus of Control (LOC)

While attributions of controllability and blame are a significant component of weight bias from an Attribution Theory perspective, there are also the theoretical components of Rotter's (1954) Locus of Control Theory (Halpert & Hill, 2011). The Locus of Control (LOC) construct is defined as whether a person places responsibility for one's behavior, success or failure either internally or externally (Meyerhoff, 2005). LOC describes the degree to which an individual perceives an outcome to be as a result of their own behavior or, as a result of someone or some other circumstance outside of their control. Meyerhoff (2005) suggests that LOC typically develops early in life and is relatively stable across time.

Research has suggested that individuals with high internal LOC will engage in health promoting behaviors, whereas individuals high on external LOC believe their health is largely related to external factors such as fate or chance (Steptoe & Wardle, 2001). Individuals will express internal LOC, when they believe their health is predominantly dictated by their own health promoting behaviors, chance externality where no matter what they themselves do they believe their health is out of their control and in the hands of fate, or powerful others externality when they believe their health is in the control of other individuals such as parents.

However, the health LOC construct has been subject to some criticism with regards to its theoretical conceptualization (Steptoe & Wardle, 2001). In Steptoe and Wardle's (2001) study it is suggested that the chance externality domain may in fact measure not only an individual's belief that their health is a matter of predetermined fate but also various genetic factors or particular environmental factors in which the individual has very limited or no control (Steptoe & Wardle, 2001). The authors note that if these factors are also related to health behaviors then it may affect the validity of the chance externality domain. Finally, many studies involving health LOC scales lacked reliability and the power values were usually in the moderate range (Steptoe & Wardle, 2001).

LOC and Weight Bias

LOC may be related to weight bias as individuals high in internal LOC typically judge another individual's weight to be the product of diet and exercise (Rukavina & Li, 2011). Rukavina and Li (2011) found a relationship between individuals high on internal perceptions of controllability and negative attitudes and bias against overweight people. While the results from this study are indicative of LOC being a predictor of weight bias, the sample in the study consisted only of adolescents from one secondary school and generally of high socioeconomic status. Not controlling for these variables may have affected the generalisability of these results (Rukavina & Li, 2011).

The current study aimed to add to the limited literature investigating LOC and prejudice and bias of overweight people. This study aimed to investigate and extend Rukavina and Li's (2011) work, which used a more diverse sample of adults and using two alternative measures of LOC: the Multidimensional Health Locus of Control Scale (MHLC; Wallston & Wallston, 1981) and the Weight Locus of Control developed by Saltzer (1982).

Prejudice as a Personality Variable

Ekehammer, Akrami, Gylje, and Zakrisson (2004) suggest that prejudice is a trait of one's personality. Historically it is suggested that if an individual is prejudiced against one out-group then it is more than likely they will be prejudiced against many other out-groups (Allport, 1954). This theory of generalized prejudice may explain the high correlations between many types of prejudice. For example, racism, sexism, and anti-gay attitudes were all found to be highly correlated (Bierly, 1985; Ekehammer & Akrami, 2003). Ekehammer and Akrami (2003) also found correlations between the previously mentioned types of racism and prejudice towards mentally disabled individuals. These high correlations between many types of prejudice lend support to Allport's (1954) theory that prejudice is a personality variable where the object of prejudice is more or less immaterial (Ekehammer et al., 2004).

Social Dominance Orientation (SDO)

As the current research investigated the predictors of a certain type of prejudice (i.e. weight bias) it was reasonable to include a personality variable as a predictor. Group conflict and inequality are pervasive in human experience (Pratto, Sidanius, Stallworth & Malle, 1994) and prompted by the omnipresent nature of such social conflict and oppression. (Pratto et al. 1994). According to the Social Dominance framework, developed by Pratto et al. (1994), minimizing group conflict is achieved by societies creating a consensus on ideologies that promote superiority of one group over another. These ideologies that stimulate and maintain group inequalities are used by societies to legitimize discrimination and prejudice (Pratto et al., 1994). Social Dominance denotes the individual differences in a person's attitudes to specific out-groups and their

propensity to view them negatively and as unequal (Schmitt, Branscombe, & Kappan, 2003).

Social Dominance Orientation (SDO) is the proposed personality variable predicting political and social attitudes (Pratto et al., 1994). According to many researchers, SDO can be defined as a generalized orientation towards, and unequal desire for, dominant/subordinate relations among social groups (Kteily, Ho & Sidanius, 2012; Kteily, Sidanius & Levin, 2011; Schmitt et al., 2003), as well as a desire for one's in-group to dominate and be superior to out-groups (Whitley, 1999). Thus, group-based hierarchies reproduce and reinforce themselves via individuals who tend toward hierarchical structures rather than egalitarian ones (Batalha, Reynolds & Newbigin, 2011).

SDO and Prejudice

Pratto et al. (1994) suggest that under their Social Dominance theory framework, individuals high in SDO will tend to favor hierarchy enhancing policies, ideologies, and behaviors whereas individuals low on SDO will tend to favor hierarchy attenuating policies and ideologies. Similarly, Whitley (1999) suggests that individuals high in SDO are motivated to denigrate and discriminate against members of out-groups, and oppose equality-enhancing social policies (e.g. affirmative action, also known as positive discrimination). Individuals high in SDO also tend to hold negative attitudes towards a variety of social groups that push for equality, such as feminists, homosexuals, ethnic minorities and people of lower socio-economic status (Pratto et al., 1994; Whitley, 1999).

As one of the most widely used personality variables in personality and social psychology according to Kteily et al. (2012), it is not surprising that there is much debate about the nature of SDO and whether it has a causal type relationship with prejudice and bias, or if it is a mere reflection of an individual's prejudice. According to Schmitt et al. (2003), while studies into individual differences are usually correlational by nature, the extent to which SDO has a causal relationship cannot be inferred. Schmitt et al. (2003) question the general predictive validity of SDO by suggesting that it is actually a reflection of an individual's attitudes towards specific out-groups in specific situations that individual had in mind at the time of testing. Their correlational studies found that sexism mediated the relationship between gender and SDO, however SDO failed to mediate the relationship between gender and sexism (Schmitt et al., 2003). This finding suggests that SDO is more accurately a product of attitudes towards specific group relationships rather than a cause (Schmitt et al., 2003).

Kteily et al. (2012) suggest SDO is both an effect and cause of intergroup relationships and attitudes. The authors suggest that SDO is affected by social context but the fluctuations still support the overall stability of SDO as a personality construct. Research by Levin (1996), also shows the flexibility of SDO when primed with different social contexts but that the levels of SDO recorded in the primed condition correlate highly with the same participants when not primed, suggesting stability across social situations.

SDO has significant empirical support as a predictor of intergroup attitudes and prejudice to be used in studies as a causal predictor (Bierly, 1985; Kteily et al., 2012; Levin, 1996; Pratto et al., 1994; Whitley, 1999). While the research using SDO as a predictor has focused predominantly on social prejudicial attitudes such as sexism and racism there has been no research found using this variable in regards to prejudice within the health/weight realm. With this in mind the present study investigated the relationship between SDO and obesity bias due to its current social saliency.

Gender and Weight Bias

Some studies suggest that men have more Social Dominance Orientation and prejudice than women (Batalha et al., 2011; Rukavina & Li, 2011), however, the results are mixed. This study aimed to investigate whether there were significant gender differences in bias and prejudice, specifically in regards to weight. Research suggests that men have higher internal LOC, which is linked to higher prejudice (Rukavina & Li, 2011).

While research has suggested that there are multiple gender differences across a vast array of health issues related to health psychology such as alcohol and drug use (Nolen-Hoeksema & Hilt, 2006), there are mixed results regarding gender differences in prejudice. Men have shown to be higher than women on both internal LOC and SDO, which have been shown to be related to prejudice (Whitley, 1999; Rukavina & Li, 2011). Rukavina and Li (2011) found significant gender differences relating to weight bias and prejudice in their study however, they suggest that the difference could be due to the fact that females have a more comprehensive understanding for the possible alternative reasons and causes of being overweight other than a person's level of controllability.

The Current Study

This study investigated the relationship between gender and obesity bias to add to the limited literature about men and women differing in the amount or strength of their prejudicial attitudes. Due to the limited literature relating to the prejudicial origins of obesity bias and prejudice, this study investigated the predictive validity of three variables empirically indicated to be related to bias and prejudice: HLOC, SDO and gender. HLOC in this study was defined as a person's perceived controllability related to health issues and was measured by two scales: the MHLC scale developed by Wallston et al. (1978) and the Weight Locus of Control scale (WLOC). SDO was defined as an individual's orientation towards and unequal desire for dominant/subordinate relations among social groups (Kteily et al., 2012; Kteily, et al., 2011; Schmitt et al.,

2003) and was measured by the SDO scale developed by Pratto et al. (1994).

The dependent variable in this study was weight bias, which was defined as the bias, discrimination and prejudice towards people who are overweight or obese (Crandall, 1994). This study employed multiple measures of weight bias to ensure many aspects and interpretations were observed such as the Attitudes Towards Obese People scale and the Beliefs About Obese People both developed by Allison, Basile, and Yuker (1991), as well as the Anti-Fat Attitudes Questionnaire by Crandall (1994). By using multiple validated measures of obesity bias and anti-fat attitudes used in previous studies it was expected that the results would assist in explaining the origins of this particular type of bias and its resulting prejudices. This may add a new perspective for the development of treatment programs and approaches to reduce bias and discrimination at a community level.

Based on the research it was hypothesized that: (1) LOC, SDO and gender would all be significant predictors of weight bias and (2) SDO would account for more of the variance in weight bias than LOC. Thirdly, it was hypothesized that (3) men would show more weight bias than women, and finally (4) individuals who scored highly in internal LOC would demonstrate more weight bias than individuals who scored more highly on chance and powerful others LOC.

Method

Participants

The 144 (62 male and 82 female) participants in this study were sourced from a community sample including students and community members (non-students). With the use of traditional paper and pen surveys as well as online survey procedures, participants came from many different education levels including High School (*n* = 27), Tafe/Trade (*n* = 18), Bachelor degree (*n* = 79), Post Graduate/ Honors degree (*n* = 9) and Masters/ PhD (*n* = 11). The age of participants ranged from 18 to 64 with a mean age of 27.64.

Materials

Anti-Fat Attitudes Questionnaire (AFA; Crandall, 1994). The AFA is a 13-item self-report questionnaire that measures attitudes towards obese individuals across three domains: dislike, fear of fat, and willpower. The dislike domain uses seven items such as "I think people who are overweight are a little untrustworthy," to measure prejudice towards obese and overweight people. Fear of fat refers to self-relevant concerns about weight and is measured by three items such as "I feel disgusted with myself when I gain weight." The final domain, willpower, measures beliefs about the controllability of weight using four items (e.g. "some people are fat because they have no willpower"). Answers are scored on a 0-9 Likert scale (0 = very strongly disagree; 9 = very strongly agree) where higher scores relate to more negative attitudes (Crandall, 1994; Pepper, 2009). Scores were calculated according to the standard scoring procedures for this measure by summing the participant's scores for each item.

A principal components analysis during the development of this scale indicated that dislike (α = .84), fear of fat (α = .79) and willpower (α = .66) showed adequate reliability (Crandall, 1994). Crandall (1994) found good convergent validity of the AFA as it shows similar correlations between controllability and negative attitudes towards overweight people as the Attitudes Towards Obese People (ATOP) and the Beliefs About Obese People (BAOP) developed by Allison et al. (1991).

Attitudes Towards Obese People (ATOP; Allison et al., 1991). This scale is a 20-item self-report measure measuring an individual's attitudes towards obese people. Answers are scored on a 0-6 Likert scale (0 = very strongly disagree; 6 = strongly agree) where higher scores indicate more positive attitudes. Examples of questions include "Obese workers cannot be as successful as other workers," and "Obese people are as happy as non-obese people." Scores were calculated according to the standard scoring procedures for this measure. Participant's scores are summed across all items after reverse scoring relevant items (items 2-6, 10, 11, 12, 14, 15, 16, 19, 20) then 60 is added to retrieve the final score.

This scale demonstrates high internal consistency and the alpha reliability coefficients ranged from .80 to .84 across the different development populations. Correlation analysis by (Allison et al., 1991) revealed that the ATOP and Beliefs About Obese People Scale (BAOP; Allison et al., 1991) had low correlation to each other (r = .40, - .45 where p = < .001) indicating discriminant validity.

Beliefs About Obese People (BAOP; Allison et al., 1991). This scale is an eight-item self-report measure of the extent to which an individual believes obesity is under the control of the obese person. Answers are scored on a 0-6 Likert scale (0 = very strongly disagree; 6 = strongly agree) where higher scores indicate that one believes that obesity is not within the control of the individual. Examples of questions include "In many cases, obesity is the result of a biological disorder," and "Most obese people eat more than non-obese people." Scores were calculated according to the standard scoring procedures for this measure. Participant's scores are summed across all items after reverse scoring relevant items (items 1, 3, 4, 5, 6 and 8) then 24 is added to retrieve the final score. Higher scores indicate a stronger belief that obesity is not under the obese person's control (Allison et al., 1991).

The BAOP was normed on 72 undergraduate students, 52 postgraduate psychology students and 514 members from the American National Association to Advance Fat Acceptance (NAAFA). This scale demonstrates high internal consistency and the alpha reliability coefficients

are .65, .79 and .82 across the three development populations.

Social Dominance Orientation (SDO; Pratto et al., 1994). This personality scale measures the individual's belief that some people are inherently superior or inferior to others and their approval of unequal group relationships. Answers are scored on a 0-7 Likert scale (0 = very negative; and 7 = very positive) where higher scores indicate higher Social Dominance Orientation. This scale includes items such as "Some groups of people are simply inferior to other groups," "It would be good if groups could be equal," and "To get ahead in life, it is sometimes necessary to step on other groups." Scores were calculated according to the standard scoring procedures for this measure. Items nine to 16 are reverse scored and participant's scores are summed across all items (Pratto et al., 1994).

Pratto et al. (1994) indicate this is a unidimensional scale with high internal consistency (α = .91) and high test-retest reliability (r = .81, p = <.01) from time1 to time2 with a 3 month interval.

Marlowe-Crowne Social Desirability Scale (M-C Form C; Reynolds, 1982). The Marlowe-Crowne Social Desirability Scale Short Form C (M-C Form C) is a 13-item self-report measure of an individual's tendency to respond in socially appropriate and acceptable ways. This short form was derived from Crowne and Marlowe's (1960) Social Desirability Scale. Participants are to answer "true" or "false" to each item. Questions include "I'm always willing to admit it when I make a mistake," and "I sometimes feel resentful when I don't get my way." Scores were calculated according to the standard scoring procedures for this measure. Scores are calculated by summing the items (items 5, 7, 9, 10, 13 are reverse scored). A "false" response corresponds to 0 and a "true" response corresponds to a score of 1 for that item (possible score range of 0 to 13). Higher scores indicate higher levels of social desirable responding. Due to the nature of self-report measures for the purposes of this study the M-C Form C was used as a covariate to partial out the effects of socially desirable responding.

Reynolds (1982) and Van de Mortel (2008) found the reliability of the MC form C to be r= .76 and Morrison and O'Connor (1999) report the Cronbach's alpha for the reliability of this scale at .69.

Multidimensional Health Locus of Control- Form A (MHLC Form A; Wallston et al., 1978) is a self-report scale measuring beliefs about determinants of a person's health (i.e. an individual's health locus of control) across three dimensions: internality (IHLC), chance externality (CHLC) and powerful others externality (PHLC). The MHLC uses a Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Questions include "I am in control of my health," "My good health is largely a matter of good fortune" and "Health professionals control my health". Each dimension has six items totaling to 18 for the entire scale. Scoring for the MHLC followed standard procedures for this instrument as described by Wallston et al. (1978). Items that relate to each of the three scales of the MHLC were summed to obtain a composite score for that subscale. Higher scores indicate a person has a strong inclination towards that particular aspect of health locus of control.

Wallston and Wallston (1981) report the alpha reliabilities of the three scales to range from .67 to .77. Additional evidence for the test-retest reliability of the MHLC is provided by Wallston and Wallston (1981) who state that the test-retest reliabilities from time1 to time2 (four to six months apart) range from .66 to .73. Evidence for convergent and discriminant validity was found as Wallston et al. (1978) correlated the scale to the Levenson IPC Scale (Levenson, 1973). This scale has three dimensions similar to the MHLC (internal, powerful others and chance). Wallston and Wallston (1981) found high correlation between their three scales and Levenson's (1973) scale counterparts and lower correlation between the MHLC scales and the non-corresponding Levenson IPC scales.

Weight Locus of Control (WLOC; Saltzer, 1982). The Weight Locus of Control Scale (WLOC) measures expectancies of locus of control with regards to one's personal weight. It was developed as a tool to aid in predicting behaviors in relation to weight reduction (Saltzer, 1982). This is a four item self-report scale, which uses a Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Two items are worded as internal measures of locus of control (e.g. "Whether I gain, lose, or maintain my weight is entirely up to me,") and as external measures of locus of control (e.g. "Being the right weight is largely a matter of good fortune."). The WLOC is scored using the scoring procedures described by Saltzer (1982). After internally worded items are reverse scored all items are summed. Low scores indicate extreme internal locus of control whereas high scores indicate extreme external locus of control.

Saltzer (1982) found Cronbach's alpha for this scale to be .58 and the test-retest reliability to be .67. Saltzer (1982) found modest correlations of .30 to .35 between the WLOC and the MHLC scales, which suggest good convergent validity without being an identical scale to locus of control.

Demographics. Participants were asked to complete demographic details on the questionnaire such as age, gender and highest education qualification achieved. No identifying information was collected in this study.

Procedure

The Bond University Human Research Ethics Committee (BUHREC) approved the ethics application and participants were initially asked to read the explanatory statement and give consent to participate, and then complete the questionnaire which included all measures.

This was done either with a traditional paper and pen questionnaire or using an online survey tool. All data was untraceable back to its source to ensure participant anonymity and all data was de-identified prior to analysis.

Results

Planned Analyses

To test the hypotheses an independent samples t-test and hierarchical multiple regressions were conducted. As there were three different assessments for obesity bias (AFA, ATOP and BAOP), three separate regressions were conducted.

Data was preliminarily screened for data entry errors and missing values. There were no missing values in the data set and assumptions for the multiple hierarchical regression analyses and sample size was met (Tabachnik & Fidell, 2007). Univariate normality was assessed and distributions were normal. Box plots were investigated for univariate outliers. Seven outliers and one extreme score were identified. When Z scores were created however, none of these outliers were outside of the ± 3.00 criteria suggested by Tabachnik and Fidell (2007). There were four different outliers outside the ± 3.00 identified, which were deleted from the data set (Tabachnik & Fidell, 2007). The data set met the assumptions of multivariate normality, linearity, and homoscedasticity. There was also an absence of multicolinerarity and singularity as there were no correlations between the variables above .9 as suggested by Tabachnik and Fidell (2007). There were no multivariate outliers found through this analysis.

Hierarchical Multiple Regression

A hierarchical multiple regression was performed to investigate the effects of Gender, LOC and SDO on weight bias using the AFA as the (dependent variable) after controlling for the effects of SDS, education and age. Means and standard deviations of the variables are outlined in Table 1. SDS, education and age were entered at Step 1 of the regression and accounted for 6.7% of the unique contribution to the total variance. Gender was entered into the equation at Step 2 and further explained 1% of the variance, however this was non-significant. Step 3 included the four LOC scales and explained an additional 5.3% of the variance in the total model. Finally, SDO was entered at Step 4 and accounted for the final 6.8% of the variance in the model. The total variance explained by the model as a whole was 19.8%, $F(139, 12) = 3.86$, $p = < .001$.

To assess whether Gender, LOC, and SDO could significantly predict obesity bias on the AFA scale the effects of each predictor were interpreted by Beta coefficients. The effects of SDS, education and age were controlled for at Step 1, F change (6, 133) = 2.67, $p = .018$ where SDS and age statistically accounted for the variance while education did not. Step 2 indicated gender did not statistically account for weight bias, F change (1, 132) = 2.53, $p = .114$. The results at Step 3 suggested that the only form of LOC that significantly predicted weight bias on the AFA was the MHLC-PO (Powerful Others Scale), F change (4, 128) = 3.01, $p = .021$. Finally at Step 4 the Beta coefficients confirmed that SDO was a significant predictor of weight bias on the AFA, F change (1, 127) = 11.77, $p = .001$. Table 2 displays the coefficients for the unstandardized B (B), standardized error of B (SEB), Standardized Beta (β) and semi-partial squared (Sr^2) for the AFA regression.

Two additional regression analyses were conducted at this point. The first assessed the effects of the same variables as regression one (gender, LOC and SDO), however the dependent variable in this regression was the ATOP scale. Only Step 1 of the model was significant accounting for 5.6% of the unique contribution. However, the overall model was significant and the total variance explained was 8.7%, $F(12, 139) = 2.10$, $p = .021$. Upon inspection of the Beta weights the only significant predictor of weight bias on the ATOP was education, specifically the Tafe/Trade group of participants, F change (6, 133) = 2.36, $p = .034$.

Table 1
Means and Standard deviations from the regression analyses for LOC, SDO, SDS, age and the three measures of weight bias.

Variable	M	SD
AFA	.01	1.01
ATOP	-.02	1.00
BAOP	-.02	1.00
MHLC-I	.01	.96
MHLC-C	-.01	1.01
MHLC-PO	-.04	.99
WLOC	.03	.95
SDO	-.03	.97
SDS	.02	.99
Age	27.64	9.63

This second additional regression investigated the effects that the predictors gender, LOC and SDO had on weight bias using the BAOP as the measure of weight bias. Steps 1 and 2 presented with negative adjusted R^2 values indicating a possible sample size issue or a situation where the IV's age, education level, SDS, and gender did not help predict responses on the BAOP scale. While the model as a whole was not significant, at Step 3 when LOC was entered into the equation there was a statistically significant unique contribution to the total explained variance of 2.6%. Step 4 accounted for a final 0.7% of the variance, F change (1, 127) = .07, $p = .797$, however this was not a significant contribution to the overall variance.

Table 2
B weights, standard error of *B*, Beta weights, Semi partial squared, R^2 change and adjusted $R^2(\Delta R^2)$ values for regression 1 (DV= AFA)

Variable	R^2 *change*	ΔR^2	*B*	*SEB*	β	Sr^2
Step 1	.11	.07				
Constant			57.44	6.28		
High School			-.08	.22	-.03	.00
Tafe/Trade			.34	.26	.11	.01
PG/Honors			.07	.35	.02	.00
Masters/PhD			-.22	.33	.06	.00
SDS			.18*	.09	.18	.03
Age			-.03*	.01	-.24	.05
Step 2	.02	.08				
Constant			59.25	6.34		
Gender			-.27	.17	-.14	.02
Step 3	.08	.13				
Constant			35.61	15.40		
WLOC			.06	.09	-.17	.00
MHLC-I			-.02	.09	-.02	.00
MHLC-C			-.06	.09	-.06	.00
MHLC-PO			.31*	.09	.23	.07
Step 4	.07	.20				
Constant			31.47	14.84		
SDO			.30*	.09	.29	.07

*Note: *p* is significant at the .05 α level

Finally, an independent samples *t*-test investigating the gender differences in weight bias across all three measures of anti-fat attitudes indicated that there were no significant differences between males and females for the AFA, $t(138) = 1.13$, $p = .261$, the ATOP, $t(138) = 1.45$, $p = .149$, nor the BAOP, $t(138) = 1.13$, $p = .260$.

Discussion

The findings from this study suggest that although there were no significant gender differences there was a possible relationship between SDO and LOC with weight bias; however the strength of these relationships remains unclear. The hypothesis that SDO, LOC and gender would be significant predictors of weight bias was only partially supported. The results indicate that SDO and LOC did significantly predict weight bias on the AFA but not the ATOP or the BOAP. Gender did not indicate a significant predictive relationship with weight bias on any of the three weight bias scales. The second hypothesis that SDO would be a more significant predictor of weight bias was also partially supported by the results from the AFA analysis, however not by the ATOP and BAOP analyses. The third hypothesis was not supported, as there were no significant differences found between males and females on either the AFA, ATOP, or BAOP. Finally, the fourth hypothesis was not supported as instead of finding that individuals high on internal LOC show more weight bias than individuals high on external LOC, the current study found the reverse. Individuals high on chance and powerful others external LOC, showed more weight bias than individuals high on internal LOC for the AFA and BAOP analyses.

While the results from this study cannot confirm a predictive relationship between SDO, LOC and weight bias, they do partially support this claim. This suggests that personality factors do come in to effect when negative attitudes and prejudices are being formed. These insights into what can potentially predict weight bias are meaningful in the health psychology field, as it highlights these issues plaguing obese adults. These individuals may experience harsh and pervasive prejudicial attitudes relating to employment, social acceptance, education and health care (Crandall, 1994; Puhl & Brownell, 2001; O'Brien et al., 2010). Understanding the nature of these negative attitudes may better equip society to be able to challenge, change and possibly alleviate discrimination and prejudice based on an individual's weight in society.

Although there has been little research relating LOC and SDO to weight bias and prejudice, the research that is available somewhat supports the argument that these factors are related. Rukavina and Li's (2011) study found a relationship between LOC and weight bias in adolescents where internal LOC was related to more negative attitudes and discriminatory behaviors towards overweight individuals than external LOC. The results from this current study were contradictory to Rukavina and Li's (2011) results in that the external domains of LOC were indicative more of negative attitudes than the internal domains. This differing direction of relationship is possible due to the ages and education levels between the two studies. Rukavina and Li's (2011) study used high school children with less experience and education about the nature of weight and obesity. The current study however, was comprised of adults predominantly of a tertiary education background who may have had more knowledge of the external factors relating to gaining, losing and maintaining weight and therefore expressed more external LOC opinions. Due to this difference in results it may be prudent to acknowledge the fact that another unknown factor relating to both external LOC and weight bias could be causing the higher levels of weight bias in adults (e.g. knowledge about the biological and genetic causes of obesity or high levels of self-compassion).

The results from this study do suggest a possible relationship between SDO and negative attitudes and bias towards overweight individuals. This relationship is somewhat mirrored in previous research that has also found significant relationships between SDO and other forms of prejudice and discrimination such as racism, sexism, attractiveness of the opposite sex, and feminism (Pratto et al., 1994; Whitley, 1999; Kteily et al., 2012). It is possible however, that the weight bias scales preceding the SDO scale primed the participants in this study to consider their

social dominance attitudes in relation to overweight/obese individuals. This could potentially indicate a reflection of weight bias and not true SDO as suggested by Schmitt et al (2003). However, Levin (1996) and Kteily et al. (2012) suggest that priming certain social contexts does not affect the legitimacy and stability of the SDO construct.

Puhl and Brownell (2003) state that stigmatization, negative attitudes towards and being prejudice against, overweight or obese individuals can cause significant psychological distress in the stigmatized overweight individual. These negative attitudes have major effects on an overweight individual's self-esteem, motivation to get healthy and social anxiety (Puhl & Brownell, 2003). As obesity is fast becoming a major health care issue (Stapleton, 2013) the negative psychological consequences of obesity bias and prejudice have relevance in the clinical and applied social science fields.

Changing the discrimination and bias towards overweight and obese individuals itself is a controversial issue. For example, there are often strong opinions that weight stigma and bias can be useful should it motivate an individual to lose weight, however Puhl and Brownell (2003) suggest that this notion is simply not true. Often weight loss involving current trend diets or extreme measures that are motivated by negative factors (e.g. fear of discrimination), are not long lasting and there are potential negative impacts on other areas of physical health (Puhl & Brownell, 2003). Puhl and Brownell (2003) also suggest that it is possible that using bias and discrimination to motivate an individual to lose weight could likely increase the already existing bias.

There has been some evidence for the reduction of weight stigma under the Attribution Theory framework by educating children and adults about the uncontrollable, genetic and biological causes of obesity from research by Crandall (1994), Puhl and Brownell (2003) and O'Brien et al. (2010). Very few studies however, have been focused on the development of interventions to reduce weight stigma and discrimination. Puhl and Brownell (2003) note that possible interventions could include education about the uncontrollable causes of obesity, evoking empathy towards obese people in the stigmatizing individual, and frequent personal contact and interactions with obese people.

The results from this study showed that SDO and LOC were only significant predictors for one of the three measures of weight bias. This may suggest that weight is a complex construct with many different dimensions. For example, anti-fat attitudes and attitudes towards obese people are both measures of weight bias, however it is possible that individuals find them to be distinctly different levels of being overweight. Therefore their attitudes may differ towards individuals based on this distinction. Similarly, attitudes towards, and beliefs about obese people are two different constructs measuring weight bias (Allison et al., 1991), furthering the complexity of the weight bias construct as a whole.

In order for the social tendency towards weight bias and prejudice to be changed it is important to investigate the origins and predictors of all three of these components of weight bias, thus the basis for their inclusion in this study. By understanding what drives an individual to express bias and discrimination towards overweight and obese individuals, interventions can then be tailored specifically to that individual or group. For example, if LOC is the internal mechanism causing weight bias then it is likely that education focused interventions about the uncontrollable nature of obesity would be more effective than empathy evocation and personal contact approaches suggested by Puhl and Brownell (2003). If SDO is the driving force behind the weight bias then it is feasible that approaches focused on developing and evoking empathy towards obese persons may significantly reduce the bias.

While the results from this study are promising there were some internal methodological limitations. Firstly, the sample size was small and the sample was predominantly from a bachelor degree or higher education background. Future research should aim to have larger sample sizes in order to gain a better idea of weight bias and prejudice in a given population. Another methodological issue in the current study is the fact that no nationality information was gathered from the participants and as the surveys were administered online it is possible that the participants were not from the same or similar populations. Not knowing the parameters of the population sample in this respect may affect the generalizability of the results.

Many of the measures used in this study have not been validated on an Australian population. Crandall's (1994) AFA and Saltzer (1982) WLOC have been shown to generalize to an Australian population (Crandall et al., 2001; Tiggemann & Rothblum, 1997). However the SDO, MHLC, BAOP and ATOP were normed and validated in the United States with no research indicating their validation with Australian samples. These were the only measures of weight bias available at the time of this study and a limitation of this nature seemed unavoidable if the aim was to gather information across a range of different aspects relating to weight bias.

While the results from this study begin to answer questions about the origins and causes of weight bias and prejudice, future research is needed to gain a more comprehensive understanding of as many aspects of this pervasive bias as possible. The negative effects of weight bias and prejudice can have lasting and debilitating psychological consequences for the overweight or obese (Friedman & Brownell, 1995), which could potentially lead to more weight related health problems. Understanding the underlying psychological constructs, such as LOC and SDO, will assist researchers and clinicians alike to: a) explain why an individual expresses negative attitudes towards an individual based solely on their physical size,

and b) to develop interventions to reduce or altogether change these negative attitudes and subsequent discriminatory behaviors in society. The current study is one step into a challenging labyrinth that is weight bias, and each step paves the way to a fairer and more positive life for individuals no matter their physical size.

References

Allison, D. B., Basile, V. C., & Yuker, H. E. (1991). The measurement of attitudes toward and beliefs about obese persons. *International Journal of Eating Disorders, 10*, 599- 607. doi: 0276-3478/91/050599-09$04.00

Allport, G. W. (1954). The nature of prejudice. Cambridge, MA: Addison-Wesley.

Batalha, L., Reynolds, K. J., & Newbigin, C. A. (2011). All else being equal: Are men always higher in social dominance orientation than women? *European Journal of Social Psychology, 41*, 796-806. doi: 10.1002/ejsp.829

Bierly, M. M. (1985). Prejudice toward contemporary outgroups as a generalized attitude. *Journal of Applied Social Psychology, 15*(2), 189-199. doi: 10.1111/j.1559-1816.1985.tb02344.x

Crandall, C. S. (1994). Prejudice against fat people: Ideology and self-interest. *Journal of Personality and Social Psychology, 66*, 882-894. doi: 0022-3514/94/$3.00

Crandall, C. S., D'Anello, S., Sakalli, N., Lazarus, E., Wieczorkowska, N., & Feather, N. T. (2001). An attribution-value model of prejudice: Anti-fat attitudes in six nations. *Personality and Social Psychology Bulletin, 27*, 30-37. doi: 10.1177/0146167201271003

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*, 349- 354. doi: 10.1037/h0047358

Ekehammar, B., & Akrami, N. (2003). The relation between personality and prejudice: A variable- and a person-centred approach. *European Journal of Personality, 17*, 449-464. doi: 10.1002/per.494

Ekehammar, B., Akrami, N., Gylge, M., & Zakrisson, I. (2004). What matters most to prejudice: Big five personality, social dominance orientation, or right-wing authoritarianism? *European Journal of Personality, 18*, 463- 482. doi: 10.1002/per.526

Friedman, M. A., & Brownell, K. D. (1995). Psychological correlates of obesity: Moving to the next research generation. *Psychological Bulletin, 117*(1), 3-20. doi: 0033-2909/95/S3.00

Halpert, R., & Hill, R. (2011). The Locus of Control Constructs' Various Means of Measurement: A researchers guide to some of the more commonly used locus of control scales. Beach Haven, NJ: Will To Power Press.

Huang, L., & Liu, J. (2005). Personality and social structural implications of the situational priming of social dominance orientation. *Personality and Individual Differences, 38*(2), 267−276. doi: 10.1016/j.paid.2004.04.006.

Kelley, H. H., & Michela, J. L. (1980). Attribution theory and research. *Annual Review of Psychology, 31*, 457-501. doi: 0066-4308/80/0201-0457$01.00

Kteily, S. N., Ho, A. K., & Sidanius, J. (2012). Hierarchy in the mind: The predictive power of social dominance orientation across social contexts and domains. *Journal of Experimental Social Psychology, 48*, 543-549. doi: 10.1016/j.jesp.2011.11.007

Kteily, S. N., Sidanius, J., & Levin, S. (2011). Social dominance orientation: Cause or 'mere effect? Evidence for SDO as a causal predictor of prejudice and discrimination against ethnic and racial outgroups. *Journal of Experimental Social Psychology, 47*, 208-214. doi: 10.1016/j.jesp.2010.09.009

Levenson, H. (1973). Multidimensional locus of control in psychiatric patients. *Journal of Consulting and Clinical Psychology, 41*, 397-404. doi: 10.1037/h0035357

Levin, S. (1996). A social psychological approach to understanding intergroup attitudes in the United States and Israel. Unpublished doctoral dissertation, Department of Psychology, UCLA, California, USA.

Meyerhoff, M. K. (2005). Perspectives on parenting. *Pediatrics for Parents, 21*(10), 8-9. Retrieved from: www.proquest.com.

Morrison, T. G., & O'Connor, W. E. (1999). Psychometric properties of a scale measuring negative attitudes toward overweight individuals. *The Journal of Social Psychology, 139*, 436-445. doi: 10.1080/00224549909598403

Musher-Eizenman, D. R., Holub, S. C., Hauser, J. C., & Young, K. M. (2007). The relationship between parent's anti-fat attitudes and restrictive feeding. *Obesity, 15*, 2095- 2102. doi: 10.1038/oby.2007.249

O'Brien, K. S., Puhl, R. M., Latner, J. D., Mir, A. S., & Hunter, J. A. (2010). Reducing anti-fat prejudice in preservice health students: A randomized trial. *Obesity, 18*, 2138- 2144. doi: 10.1038/oby.2010.79.

Pepper, A. C. (2009). Disordered eating, antifat attitudes, and barriers to treatment in college women from urban and rural areas. Unpublished doctoral dissertation, California State University, San Marcos, California: USA.

Perry, R., & Sibley, C. G. (2011). Social dominance orientation: Mapping a baseline individual difference component across self-categorizations. *Journal of Individual Differences, 32*(2), 110-116. doi: 10.1027/1614-0001/a000042

Pratto, F, Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality

variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*, 741-763. doi: 10.1037/0022-3514.67.4.741

Puhl, R. M., & Bownell, K. D. (2001). Bias, discrimination, and obesity. *Obesity Research, 9*, 788-805. doi: 10.1038/oby.2001.108

Puhl, R. M., & Brownell, K. D. (2003). Psychosocial origins of obesity stigma: Toward changing a pervasive bias. *Obesity Reviews, 4*, 213-227. doi: 10.1046/j.1467-789X.2003.00122.x

Reynolds, W. (1982). Development of reliable and valid short forms of the marlowe crowne social desirability scale. *Journal of Clinical Psychology, 38*, 119-125. doi:10.1002/10974679(198201)38:1<119::AIDJCLP2270380118>3.0.CO;2-I

Rotter, J. B. (1954). Social Learning and Clinical Psychology. N.Y: Prentice-Hall.

Rukavina, P. B., & Li, W. (2011). Adolescents' perceptions of controllability and its relationship to explicit obesity bias. *Journal of School Health, 81*(1), 8-14. doi: 10.1111/j.1746-1561.2010.00551.x

Saltzer, E. B. (1982). The weight locus of control (WLOC) scale: A specific measure for obesity research. *Journal of Personality Assessment, 46*(6), 620-628. doi: 10.1207/s15327752jpa4606_11

Schmitt, M. T., Branscombe, N. R., & Kappan, D. M. (2003). Attitudes towards group-based inequality: Social dominance or social identity? *British Journal of Social Psychology,42*, 161-186. Retrieved from: www.proquest.com.

Stapleton, P.B. (2013). Long-term weight loss. In D. Church & S. Marohn (Eds.), *The clinical EFT handbook: A definitive resource for practitioners, scholars, clinicians, and researchers* (pp. 377-388). USA: Energy Psychology Press (Hay House). In press.

Steptoe, A., & Wardle, J. (2001). Locus of control and health behavior revisited: A multivariate analyses of young adults from 18 countries. *British Journal of Psychology, 92*, 659-672.
Retrieved from www.proquest.com.

Tabachnik, B. G., & Fidell, L. S. (2006). Using multivariate statistics (5th Ed.). New York: Harper & Row.

Tiggemann, M., & Rothblum, E. D. (1997). Gender differences in internal beliefs about weight and negative attitudes towards self and others. *Psychology of Women Quarterly, 21*, 581-593.
doi: 10.1111/j.1471-6402.1997.tb00132.x

Van de Mortel, T. F. (2008). Faking it: Social desirability response bias in self-report research. *Australian Journal of Advanced Nursing, 25*, 40- 48. Retrieved from http://www.ajan.com.au.

Wallston, K. A., & Wallston, B. S. (1981). Health locus of control scales. In H. Lefcourt (Ed.), *Research with the locus of control construct* (vol.1, pp. 189- 243). New York: Academic Press

Wallston, K. A., Wallston, B. S., & DeVellis, R. (1978). Development of the multidimensional health locus of control (MHLC) Scales. *Health Education Monographs, 6*, 160-170.
doi: 10.1177/109019817800600107

Wallston, B. S., Wallston, K. A., Kaplan, G. D., & Maides, S. A. (1976). Development and validation of the Health Locus of Control (HLC) Scale. *Journal of Consulting and Clinical Psychology, 44*, 580-585. doi: 10.1037/0022-006X.44.4.580

Weiner, B. (1974). Achievement motivation and attribution theory. Morristown, N.J: General Learning Press.

Whitley, B. E. (1999). Right-wing authoritarianism, social dominance orientation and prejudice. *Journal of Personality and Social Psychology, 77*(1), 126-134. doi:0022-3514/99/$3.00